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One-and-a-half Wavelength Approach

Z. Dauter (NCI/NSLS)

Beamline(s): X9B

In many cases single-wavelength anomalous diffraction (SAD) phasing leads to a successful structure solution of macromolecules, but it is impossible to predict beforehand if single-wavelength data with a certain amount of anomalous signal will be sufficient. It is therefore safer to continue collecting diffraction data at different wavelengths according to a MAD protocol, but to simultaneously attempt to phase the first data set by the SAD method. If this is successful, then further data collection can be abandoned. This "1.5-wavelength" approach may save a substantial amount of time and effort and diminish the effects of crystal radiation damage. The examples of this approach at the NSLS beamline X9B are presented and the principles of SAD phasing are illustrated using vector diagrams in the Argand plane.